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JOSEPH A. WIDAY
VICE PRESIDENT & PLANT MANAGER
GINNA STATION

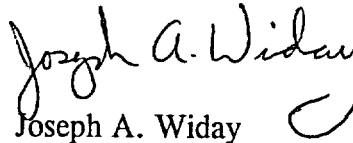
April 30, 2003

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Emergency Operating Procedures
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

As requested, enclosed are Ginna Station Emergency Operating Procedures.

Very truly yours,


Joseph A. Widay

JAW/jdw

xc: U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Ginna USNRC Senior Resident Inspector

Enclosure(s):

AP Index
ATT Index
ATT-14.1, Rev 6
AP-RCS.4, Rev 14
AP-RHR.1, Rev 19
AP-RHR.2, Rev 13
AP-TURB.4, Rev 17

A002

NPSP0200
WRIGHTJ

Ginna Nuclear Power Plant
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INPUT PARAMETERS: TYPE: PRATT, PRAP, PRE

STATUS VALUE(S): EF, QU

5 YEARS ONLY:

PRAP ABNORMAL PROCEDURE

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
AP-CCW 1	LEAKAGE INTO THE COMPONENT COOLING LOOP	015	06/26/2002	06/26/2002	06/26/2007	EF
AP-CCW 2	LOSS OF CCW DURING POWER OPERATION	017	11/19/2002	06/26/2002	06/26/2007	EF
AP-CCW 3	LOSS OF CCW - PLANT SHUTDOWN	015	11/19/2002	06/26/2002	06/26/2007	EF
AP-CR 1	CONTROL ROOM INACCESSIBILITY	019	02/25/2003	06/26/2002	06/26/2007	EF
AP-CVCS 1	CVCS LEAK	013	06/26/2002	06/03/2002	06/03/2007	EF
AP-CVCS 3	LOSS OF ALL CHARGING FLOW	003	06/26/2002	02/26/1999	02/26/2004	EF
AP-CW 1	LOSS OF A CIRC WATER PUMP	011	06/26/2002	04/16/2003	04/16/2008	EF
AP-ELEC 1	LOSS OF 12A AND/OR 12B BUSES	024	02/25/2003	06/26/2002	06/26/2007	EF
AP-ELEC 2	SAFEGUARD BUSES LOW VOLTAGE OR SYSTEM LOW FREQUENCY	010	06/26/2002	06/26/2002	06/26/2007	EF
AP-ELEC 3	LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350 F)	011	06/26/2002	06/26/2002	06/26/2007	EF
AP-ELEC.14/16	LOSS OF SAFEGUARDS BUS 14/16	004	06/26/2002	06/26/2002	06/26/2007	EF
AP-ELEC 17/18	LOSS OF SAFEGUARDS BUS 17/18	004	06/26/2002	06/26/2002	06/26/2007	EF
AP-FW 1	ABNORMAL MAIN FEEDWATER FLOW	014	07/25/2002	06/26/2002	06/26/2007	EF
AP-IA 1	LOSS OF INSTRUMENT AIR	018	06/26/2002	04/16/2003	04/16/2008	EF
AP-PRZR 1	ABNORMAL PRESSURIZER PRESSURE	013	06/26/2002	06/26/2002	06/26/2007	EF
AP-RCC 1	CONTINUOUS CONTROL ROD WITHDRAWAL/INSERTION	008	06/26/2002	04/16/2003	04/16/2008	EF
AP-RCC 2	RCC/RPI MALFUNCTION	010	06/26/2002	01/22/2002	01/22/2007	EF
AP-RCC 3	DROPPED ROD RECOVERY	006	02/25/2003	02/25/2003	02/25/2008	EF
AP-RCP 1	RCP SEAL MALFUNCTION	014	06/26/2002	04/24/2003	04/24/2008	EF
AP-RCS 1	REACTOR COOLANT LEAK	016	06/26/2002	04/16/2003	04/16/2008	EF
AP-RCS.2	LOSS OF REACTOR COOLANT FLOW	011	06/26/2002	04/16/2003	04/16/2008	EF
AP-RCS.3	HIGH REACTOR COOLANT ACTIVITY	010	06/26/2002	04/01/2002	01/22/2007	EF
AP-RCS 4	SHUTDOWN LOCA	014	04/30/2003	04/30/2003	04/30/2008	EF
AP-RHR.1	LOSS OF RHR	019	04/30/2003	04/30/2003	04/30/2008	EF
AP-RHR 2	LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	013	04/30/2003	04/30/2003	04/30/2008	EF
AP-SG 1	STEAM GENERATOR TUBE LEAK	003	11/21/2002	06/26/2002	06/26/2007	EF
AP-SW 1	SERVICE WATER LEAK	017	06/26/2002	04/21/2003	04/21/2008	EF
AP-SW 2	LOSS OF SERVICE WATER	002	06/26/2002	10/31/2001	10/31/2006	EF
AP-TURB 1	TURBINE TRIP WITHOUT RX TRIP REQUIRED	011	06/26/2002	06/26/2002	06/26/2007	EF
AP-TURB 2	TURBINE LOAD REJECTION	018	06/26/2002	06/26/2002	06/26/2007	EF

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INPUT PARAMETERS: TYPE: PRATT, PRAP, PRE

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5 YEARS ONLY:

PRAP ABNORMAL PROCEDURE

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
AP-TURB 3	TURBINE VIBRATION	011	06/26/2002	06/26/2002	06/26/2007	EF
AP-TURB 4	LOSS OF CONDENSER VACUUM	017	04/30/2003	04/30/2003	04/30/2008	EF
AP-TURB 5	RAPID LOAD REDUCTION	006	06/26/2002	06/26/2002	06/26/2007	EF
PRAP	TOTAL: 33					

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INPUT PARAMETERS: TYPE: PRATT, PRAP, PRE

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5 YEARS ONLY:

PRATT EOP ATTACHMENTS

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ATT-1 0	ATTACHMENT AT POWER CCW ALIGNMENT	003	02/12/2003	02/12/2003	02/12/2008	EF
ATT-1 1	ATTACHMENT NORMAL CCW FLOW	000	05/18/2000	05/18/2000	05/18/2005	EF
ATT-2 1	ATTACHMENT MIN SW	005	02/01/2001	02/03/2003	02/03/2008	EF
ATT-2 2	ATTACHMENT SW ISOLATION	008	03/06/2002	03/27/2003	03/27/2008	EF
ATT-2 3	ATTACHMENT SW LOADS IN CNMT	004	03/06/2002	12/31/1999	12/31/2004	EF
ATT-2 4	ATTACHMENT NO SW PUMPS	001	01/08/2002	10/31/2001	10/31/2006	EF
ATT-2 5	ATTACHMENT SPLIT SW HEADERS	000	06/26/2002	06/26/2002	06/26/2007	EF
ATT-3 0	ATTACHMENT CI/CVI	006	03/06/2002	01/06/1999	01/06/2004	EF
ATT-3 1	ATTACHMENT CNMT CLOSURE	004	03/06/2002	01/25/1999	01/25/2004	EF
ATT-4 0	ATTACHMENT CNMT RECIRC FANS	003	07/26/1994	03/27/2003	03/27/2008	EF
ATT-5 0	ATTACHMENT COND TO S/G	005	03/06/2002	12/31/1999	12/31/2004	EF
ATT-5 1	ATTACHMENT SAFW	008	05/30/2002	12/31/1999	12/31/2004	EF
ATT-5 2	ATTACHMENT FIRE WATER COOLING TO TDAFW PUMP	003	01/14/1999	01/14/1999	01/14/2004	EF
ATT-6 0	ATTACHMENT COND VACUUM	003	12/18/1996	02/03/2003	02/03/2008	EF
ATT-7 0	ATTACHMENT CR EVAC	006	03/06/2002	02/03/2003	02/03/2008	EF
ATT-8 0	ATTACHMENT DC LOADS	006	03/22/1999	01/14/1999	01/14/2004	EF
ATT-8 1	ATTACHMENT D/G STOP	005	03/06/2002	02/03/2003	02/03/2008	EF
ATT-8 2	ATTACHMENT GEN DEGAS	008	06/20/2002	08/17/1999	08/17/2004	EF
ATT-8 3	ATTACHMENT NONVITAL	004	03/06/2002	02/03/2003	02/03/2008	EF
ATT-8 4	ATTACHMENT SI/UV	005	03/06/2002	02/03/2003	02/03/2008	EF
ATT-8 5	ATTACHMENT LOSS OF OFFSITE POWER	000	05/02/2002	05/02/2002	05/02/2007	EF
ATT-9 0	ATTACHMENT LETDOWN	008	03/06/2002	03/06/2002	03/06/2007	EF
ATT-9 1	ATTACHMENT EXCESS L/D	005	03/06/2002	10/31/2001	10/31/2006	EF
ATT-10 0	ATTACHMENT FAULTED S/G	006	03/06/2002	03/27/2003	03/27/2008	EF
ATT-11 0	ATTACHMENT IA CONCERNS	002	04/07/1997	03/27/2003	03/27/2008	EF
ATT-11 1	ATTACHMENT IA SUPPLY	003	03/06/2002	03/27/2003	03/27/2008	EF
ATT-11 2	ATTACHMENT DIESEL AIR COMPRESSOR	004	11/18/2002	03/10/2003	03/10/2008	EF
ATT-12 0	ATTACHMENT N2 PORVS	005	02/12/2003	02/12/2003	02/12/2008	EF
ATT-13 0	ATTACHMENT NC	003	02/12/2003	02/12/2003	02/12/2008	EF
ATT-14 0	ATTACHMENT NORMAL RHR COOLING	003	03/06/2002	09/23/1999	09/23/2004	EF

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PRATT

EOP ATTACHMENTS

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ATT-14 1	ATTACHMENT RHR COOL	006	04/30/2003	01/08/2002	01/08/2007	EF
ATT-14 2	ATTACHMENT RHR ISOL	003	02/12/2003	02/12/2003	02/12/2008	EF
ATT-14 3	ATTACHMENT RHR NPSH	003	03/06/2002	01/06/1999	01/06/2004	EF
ATT-14 5	ATTACHMENT RHR SYSTEM	003	03/20/2003	02/03/2003	02/03/2008	EF
ATT-14 6	ATTACHMENT RHR PRESS REDUCTION	002	03/06/2002	01/14/1999	01/14/2004	EF
ATT-15 0	ATTACHMENT RCP START	009	03/06/2002	03/17/2000	03/17/2005	EF
ATT-15 1	ATTACHMENT RCP DIAGNOSTICS	003	04/24/1997	02/03/2003	02/03/2008	EF
ATT-15 2	ATTACHMENT SEAL COOLING	005	03/06/2002	02/03/2003	02/03/2008	EF
ATT-16 0	ATTACHMENT RUPTURED S/G	011	07/18/2001	01/11/2000	01/11/2005	EF
ATT-16 1	ATTACHMENT SGTL	002	03/06/2002	09/08/2000	09/08/2005	EF
ATT-16 2	ATTACHMENT RCS BORON FOR SGTL	002	04/09/2002	09/08/2000	09/08/2005	EF
ATT-17 0	ATTACHMENT SD-1	014	06/20/2002	02/29/2000	02/28/2005	EF
ATT-17 1	ATTACHMENT SD-2	006	03/06/2002	01/30/2001	01/30/2006	EF
ATT-18 0	ATTACHMENT SFP - RWST	005	03/06/2002	02/03/2003	02/03/2008	EF
ATT-20 0	ATTACHMENT VENT TIME	003	07/26/1994	02/03/2003	02/03/2008	EF
ATT-21 0	ATTACHMENT RCS ISOLATION	002	03/06/2002	02/03/2003	02/03/2008	EF
ATT-22 0	ATTACHMENT RESTORING FEED FLOW	003	05/02/2002	01/22/2002	01/22/2007	EF
ATT-23 0	ATTACHMENT TRANSFER 4160V LOADS	000	02/26/1999	02/26/1999	02/26/2004	EF
ATT-24 0	ATTACHMENT TRANSFER BATTERY TO TSC	000	09/08/2000	09/08/2000	09/08/2005	EF
ATT-26 0	ATTACHMENT RETURN TO NORMAL OPERATIONS	000	10/31/2001	10/31/2001	10/31/2006	EF

PRATT TOTAL: 50

EOP: ATT-14.1	TITLE: ATTACHMENT RHR COOL	REV: 6 PAGE 1 of 6
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Responsible Manager RS Williams Date 4-30-2003

NOTE: Maintain operating RCP #1 seal DP greater than 220 psid.

1. Maintain RCS Temp < 350°F AND align the RHR system for shutdown operations as follows:
2. Open RHR Heat Exchanger bypass (HCV-626) isolation valves:
 - V-712A
 - V-712B
3. Ensure closed the following valves:
 - RHR PUMP DISCHARGE TO RX VESSEL DELUGE MOV-852A
 - RHR PUMP DISCHARGE TO RX VESSEL DELUGE MOV-852B

4. Open RHR Pump discharge crosstie valves
 - V-709C
 - V-709D
5. Open RHR PUMP DISCHARGE TO SI PUMP SUCTION MOV-857C
6. Verify RHR PUMP SUCTION FROM RWST MOV-856 open.

NOTE: WHEN the next step is performed, THEN Annunciator A-20 will light.

7. Start one RHR Pump AND locally throttle open RHR PUMP DISCHARGE TO SI PUMP SUCTION valves MOV-857A and 857B to maintain combined flow of < 1500 GPM as read on FI-931A and 931B.
 - RHR Pump Started
 - MOV-857A Throttled
 - MOV-857B Throttled
8. Throttle RHR Flow control valves to 50% open
 - HCV-624 Throttled
 - HCV-625 Throttled
 - HCV-626 Throttled

9. AFTER the RHR Pump has run 10 minutes, THEN obtain a sample of RHR System to verify Boron Concentration is greater than RCS Boron Concentration. If not, continue running RHR Pump until RCS Boron Concentration is acceptable.

EOP:	TITLE:	REV: 6
ATT-14.1	ATTACHMENT RHR COOL	PAGE 2 of 6

NOTE: WHEN the next step is performed, THEN Annunciator A-20 will extinguish.

10. Stop the running RHR PUMP.
11. Place RHR suction from RWST MOV-856 Key Switch to ON.
12. Close RHR PUMP SUCTION FROM RWST MOV-856.
13. Close RHR PUMP DISCHARGE TO SI PUMP SUCTION MOVs

- MOV-857A
- MOV-857B
- MOV-857C

NOTE: DO NOT remove fuses.

14. Open the following breakers (Bkr):
 - MOV-857A (MCC C Pos 7M) Bkr
 - MOV-857B (MCC D Pos 7M) Bkr
 - MOV-857C (MCC C Pos 15J) Bkr
15. Close RHR Flow control valves
 - HCV-624
 - HCV-625
 - HCV-626
16. Close RHR PUMP SUCTION FROM CNMT SUMP B MOV-851A breaker (MCC C Pos 10M).
17. Close RHR PUMP SUCTION FROM CNMT SUMP B MOV-851B breaker (MCC D Pos 10M).
18. Close RHR PUMP SUCTION FROM CNMT SUMP B MOVs. IF MOV-851A and/or MOV-851B will NOT close, THEN consult Plant Staff to determine if MOV-850A and/or MOV-850B should be closed.
 - MOV-851A
 - MOV-851B

NOTE: DO NOT remove fuses.

19. Open RHR PUMP SUCTION FROM CNMT SUMP B MOV-851A breaker (MCC C Pos 10M).

EOP:	TITLE:	REV: 6
ATT-14.1	ATTACHMENT RHR COOL	PAGE 3 of 6

20. Open RHR PUMP SUCTION FROM CNMT SUMP B MOV-851B breaker (MCC D Pos 10M).
 21. WHEN Primary System pressure reaches 350 to 360 psig, THEN perform the following:
 22. To prevent flashing in the CCW System, start a second Component Cooling Water Pump and put a second Component Cooling Water Heat Exchanger into service.
- NOTE:** IF FI-619 (PPCS point F0619) is > 4900 gpm, THEN notify the Shift Supervisor (Flow induced vibration concern).
23. With two CCW HX's in service, ensure CCW flow is \leq 4900 gpm.
 24. Control RCS pressure using PRZR heaters and spray as follows:
 - 24.1 IF at least one RCP is running, THEN reduce RCS pressure to approximately 325 psig and stabilize pressure, unless otherwise directed by procedure in effect.
 - 24.2 IF NO RCP running, THEN stabilize RCS pressure between 350 and 360 psig, unless otherwise directed by procedure in effect.
 25. Enable LTOP RCS pressure alarms associated with Annunciator F-29 as follows:
 - 25.1 Replace annunciator window F-29 with LTOP RCS pressure alarm window.
 - 25.2 On PPCS, substitute a value of one (1) for point ID KPLTOP.
 - 25.3 Substitute a value for P0420 or P0420A greater than 390 psig.
 - 25.4 Verify that annunciator F-29 alarms.
 - 25.5 Restore selected point to processing.
 - 25.6 Verify that annunciator F-29 clears.
 - 25.7 Substitute a value for P0420 or P0420A less than 300 psig.
 - 25.8 Verify that annunciator F-29 alarms.
 - 25.9 Restore selected point to processing.
 - 25.10 Verify that annunciator F-29 clears.

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ATT-14.1	ATTACHMENT RHR COOL	PAGE 4 of 6

26. Open CCW to RHR HX A MOV-738A.

27. Open CCW to RHR HX B MOV-738B.

NOTE: IF FI-619 (PPCS point F0619) is > 4900 gpm,
THEN notify the Shift Supervisor (Flow induced
vibration concern).

28. AFTER MOV-738A and MOV-738B are open, verify CCW flow is
≤ 4900 gpm on FI-619.

29. Verify LOW PRESS LTDN PRESS PI-135 PCV-135 setpoint set to
300 psig.

30. Open RHR HX BYPASS HCV-626 to 25% to ensure RHR System
pressure equalization.

31. Station an Auxiliary Operator at RHR pressure indicator
PIC-629 (South of Spent Fuel Pool Pump A).

32. IF letdown NOT in service, THEN perform the following:

- a. Place switches for AOV-200A, 200B, 202 to CLOSE
- b. Open AOV-427 (reset XY relays, if necessary)
- c. Open AOV-200A
- d. Go to Step 34

33. Ensure CVCS letdown aligned up to PCV-135.

34. SLOWLY open RHR LETDOWN TO CVCS HCV-133 to 100% to fill AND
pressurize the RHR system.

35. Verify RHR pressure (PIC-629) is within 200 psig of RCS
pressure (P-420 or P-420A). Additional letdown orifice valves
may be opened to help equalize pressure.

36. Remove AND reinsert control power fuses for RHR PUMP SUCTION
FROM LOOP A HOT LEG MOV-700. (MCC C Pos 7F)

37. Close MOV-700 breaker (MCC C Pos 7F).

38. Remove AND reinsert control power fuses for RHR PUMP SUCTION
FROM LOOP A HOT LEG MOV-701. (MCC D Pos 7F)

39. Close MOV-701 breaker (MCC D Pos 7F).

40. Open RHR PUMP SUCTION FROM LOOP A HOT LEG MOVs.

- MOV-701
- MOV-700

EOP:	TITLE:	REV: 6
ATT-14.1	ATTACHMENT RHR COOL	PAGE 5 of 6

41. Verify closed RHR HX flow control valves.

- HCV-626
- HCV-625
- HCV-624

NOTE: IF letdown in service, THEN it may be necessary to close down PCV-135 following RHR Pump start to maintain < 70 gpm Letdown flow. This can be done by raising PCV-135 AUTO setpoint OR taking MANUAL control of PCV-135 AND closing.

NOTE: IF letdown in service, THEN PI-135 may read 100 psi greater than PI-420 due to RHR Pump shutoff head.

NOTE: Annunciator A-20 will light.

42. Start one RHR PUMP.

NOTE: DO NOT run two (2) RHR pumps with the discharge crossties open AND flow < 1200 gpm.

43. IF letdown in service, THEN adjust Low Press LTDN Press PCV-135 to establish desired Letdown flow (FI-134).

NOTE: PCV-135 (Letdown flow) determines the amount of flow during this temperature equalization.

44. Maintain flow at a minimum through HCV-624 and HCV-625 for 5 minutes to equalize the temperature of the RHR Loops.

45. Perform the following to establish the RHR System as a heat sink and secure the Steam Generators as heat sinks:

NOTE: To prevent flashing in the CCW System, ensure 2 CCW Pumps and 2 CCW Heat Exchangers are in service.

45.1 Remove AND reinsert control power fuses for RHR PUMP DISCHARGE TO LOOP B COLD LEG MOV-720.

45.2 Close MOV-720 breaker (MCC C Pos 7C).

45.3 Remove AND reinsert control power fuses for RHR PUMP DISCHARGE TO LOOP B COLD LEG MOV-721.

45.4 Close MOV-721 breaker (MCC D Pos 7C).

EOP ATT-14.1	TITLE: ATTACHMENT RHR COOL	REV: 6 PAGE 6 of 6
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45.5 Open RHR PUMP DISCHARGE TO LOOP B COLD LEG.

- MOV-720
- MOV-721

45.6 Manually increase RHR flow and adjust HCV-624, HCV-625, and HCV-626; while simultaneously reducing Steam Generator feeding AND steaming rate to control RCS temperature.

NOTE: Maximizing feeding and steaming during subsequent cooldown on RHR will assist in SG cooling, and allow access as soon as possible.

45.7 WHEN Steam Generator feeding AND steaming has been reduced to the desired rate or secured, THEN continue increasing RHR flow AND/OR adjust HCV-624, HCV-625, and HCV-626 as necessary to establish the desired cooldown rate.

45.8 IF letdown in service, THEN readjust Low Press LTDN Press PCV-135 to re-establish desired letdown flow.

NOTE: FI-626 flow indication will be lost during reset of flow alarm.

45.9 Notify I&C to reset RHR flow alarm to 400 gpm.

45.10 WHILE I&C resets the RHR flow alarm, THEN place RHR HX BYPASS HCV-626 in MANUAL.

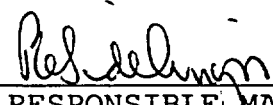
45.11 Open RHR LETDOWN TO CVCS HCV-133.

EOP: AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 1 of 35
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23


RESPONSIBLE MANAGER

4-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 2 of 35
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A. PURPOSE - This procedure provides actions for protecting the reactor core in the event of a loss of coolant accident (LOCA) that occurs during Mode 3 after the SI accumulators are isolated or Mode 4.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. AP-RHR.1, LOSS OF RHR, when RCS leak is indicated with RCS temperature greater than 200°F.

2. SYMPTOMS - The symptoms of shutdown loss of coolant accident during Modes 3 and 4 are:

- a. Uncontrolled decrease in PRZR level, or
- b. Uncontrolled decrease in RCS subcooling, or
- c. Radiation alarms in CNMT, or
- d. CNMT sump level alarms

EOP: AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 3 of 35
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u></p> <ul style="list-style-type: none"> o Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION. o Adverse CNMT conditions should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr. 		
<p>* 1 Monitor RCS Conditions:</p> <ul style="list-style-type: none"> o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F FIG-1.0, FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT] 	<p>Perform the following:</p> <ul style="list-style-type: none"> a. Stop RHR pumps and place in PULL STOP. b. Close RHR discharge valves to SI pump suction <ul style="list-style-type: none"> • MOV-857A • MOV-857B • MOV-857C 	
<p>2 Isolate RCS Letdown:</p> <ul style="list-style-type: none"> a. Close letdown isolation, AOV-427 b. Place letdown orifice valve switches to CLOSE (AOV-200A, AOV-200B, and AOV-202) c. Close letdown isolation, AOV-371 d. Close RHR letdown to CVCS, HCV-133 e. Place letdown pressure controller, PCV-135, in MANUAL and close valve (demand at 100%) f. Close excess letdown isolation valve, AOV-310 		

EOP	TITLE:	REV: 14
AP-RCS.4	SHUTDOWN LOCA	PAGE 4 of 35

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: IF the RCS is water solid, THEN charging should be controlled to maintain RCS pressure.

3 Establish Required RCS Injection Flow:

a. Charging pumps - ANY RUNNING

a. Perform the following:

- 1) IF CCW flow is lost to any RCP thermal barrier OR any #1 seal outlet temperature offscale high, THEN dispatch AO to locally isolate seal injection to affected RCP.

- RCP A, V-300A
- RCP B, V-300B

- 2) Ensure HCV-142 open, demand at 0%.

b. Align charging pump suction to RWST:

- b. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).

- o LCV-112B -OPEN
- o LCV-112C -CLOSED

IF LCV-112C can NOT be closed, THEN perform the following:

- 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).

- 2) Verify charging pump A NOT running and place in PULL STOP.

- 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).

c. Start charging pumps (75 kw) and adjust charging flow to maintain PRZR level

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Verify Charging Flow Adequate:	
a.	Check the following:	a. Go to Step 5.
	o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	
	o PRZR level - GREATER THAN 5% [30% adverse CNMT]	
	o PRZR level - STABLE OR INCREASING	
b.	Verify charging flow needed to maintain PRZR level stable - LESS THAN 75 gpm (PPCS point FCHG)	b. Go to Step 7.
c.	Go to AP-RCS.1, REACTOR COOLANT LEAK	

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

- o IF RWST LEVEL DECREASES TO LESS THAN 28%, THEN THE SI SYSTEM SHOULD BE ALIGNED FOR SUMP RECIRCULATION USING ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, STEPS 1 THROUGH 14.
- o RP TECH SHOULD BE CONSULTED PRIOR TO ENTERING A HIGH AIRBORNE AREA.

5 Verify SI Injection Capability:

a. Check RCS temperature - LESS THAN 350°F

a. Perform the following:

1) Ensure SI pump discharge valves to RCS cold legs - OPEN

- SI Pump A, MOV-878B
- SI Pump B, MOV-878D

2) Go to Step 5c.

b. SI pump discharge valves to RCS - OPEN

b. Manually open valves. Dispatch AO to locally restore power to the following if necessary (locked valve key required):

- SI pump A, MOV-878A and MOV-878B
- SI pump B, MOV-878C and MOV-878D

- MOV-878A, MCC C position 8C
- MOV-878B, MCC D position 8C
- MOV-878C, MCC C position 8F
- MOV-878D, MCC D position 8F

c. SI pumps - AT LEAST TWO PUMPS AVAILABLE

c. Dispatch AO to restore power to at least two SI pump(s), if necessary.

- SI pump A, Bus 14 position 20A
- SI pump B, Bus 16 position 12A
- SI pump C, Bus 14 position 19A
OR Bus 16 position 13A

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6 Establish SI Flow:

a. Verify the following valves -
OPEN

- RWST outlet valves (MOV-896A and MOV-896B)
- SI pump C suction valves (MOV-1815A and MOV-1815B)

b. Open SI pump suction valves from RWST:

- MOV-825A
- MOV-825B

c. Start ONE SI pump

a. Manually open valves.

b. Ensure at least one SI pump suction valve from RWST open.

- MOV-825A
- MOV-825B

7 Initiate Actions To Protect Personnel In CNMT:

a. Evacuate personnel from CNMT

b. Periodically monitor CNMT radiation

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8 Establish Required CNMT Conditions:

- a. Depress MANUAL CNMT ISOLATION pushbutton
- b. Verify CI/CVI valves - CLOSED
- b. Manually close CI and CVI valves. IF valves can NOT be verified closed by MCB indication, THEN dispatch AO to locally close valves (Refer to ATT-3.0, ATTACHMENT CI/CVI).
- c. Start all available CNMT RECIRC fans (205 kw each)
- d. Dispatch AO to locally fail open CNMT RECIRC fan cooler SW outlet valves (INT BLDG basement by MG sets)
 - FCV-4561
 - FCV-4562

* 9 Monitor RCP Operation:

- a. RCPs - ANY RUNNING
- a. Go to Step 10.
- b. Check RCP #1 seal D/P - GREATER THAN 220 PSID
- b. Stop affected RCP(s) and go to Step 9d.
- c. Check RCP #1 seal leakoff - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF
- c. IF RCP #1 seal failure is suspected, THEN stop affected RCP(s).
- d. Ensure PRZR spray valves - CLOSED
 - PCV-431A
 - PCV-431B

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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10 Check RHR Pump Status:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. RHR pumps aligned for injection mode: <ul style="list-style-type: none"> o RWST to RHR pump suction valve, MOV-856 - OPEN o RHR suction valves from loop A hot leg (MOV-700 and MOV-701) - CLOSED b. Go to Step 12 | <ul style="list-style-type: none"> a. Go to Step 11. |
|---|---|

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: Continue with this procedure starting at Step 13 while aligning RHR for injection. WHEN RHR aligned, THEN do Step 12.

11 Establish RHR Injection Alignment:

- | | |
|--|---|
| a. Stop any running RHR pump | |
| b. Close RHR normal cooling valves: | b. Ensure at least one suction valve and one discharge valve closed. |
| o RHR suction valves from loop A hot leg (MOV-700 and MOV-701) - CLOSED | |
| o RHR discharge valves to loop B cold leg (MOV-720 and MOV-721) - CLOSED | |
| c. Verify alignment of RHR suction valves from sump B: | |
| 1) MOV-850A and MOV-850B (outside CNMT) - CLOSED | 1) Close MOV-850A and MOV-850B. Do <u>NOT</u> continue until valves closed. |
| 2) MOV-851A and MOV-851B (inside CNMT) - OPEN | 2) Open MOV-851A and MOV-851B. |
| d. Verify open RHR pump suction valves (MOV-704A and MOV-704B) | d. Manually open valves. |
| e. Check RHR pump suction temperature - LESS THAN 280°F (PPCS point T0684A or T0684B) | e. Go to Step 13. |
| f. Open RWST to RHR pump suction valve, MOV-856 (energize DC control power key switch) | |
| g. Place RHR Hx bypass valve, HCV-626, to MANUAL and close valve | |
| h. Open RHR Hx flow control valves (HCV-624 and HCV-625) | |
| i. Open RHR core deluge valves (MOV-852A and MOV-852B) | |

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If RHR Injection Flow Required:	
a.	RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Perform the following: <ol style="list-style-type: none"> 1) Open RHR core deluge valves <ul style="list-style-type: none"> • MOV-852A • MOV-852B 2) Start one RHR pump.
13	Verify Adequate SI Flow:	
a.	Check RVLIS - AVAILABLE	a. <u>IF</u> PRZR level greater than 5% [30% adverse CNMT] and stable or increasing, <u>THEN</u> go to Step 13c. <u>IF NOT</u> , <u>THEN</u> start to SI pumps to restore PRZR level to greater than 5% [30% adverse CNMT] and stable or increasing and go to Step 14.
b.	Check RVLIS indication: <ul style="list-style-type: none"> o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT] <p>-OR-</p> <ul style="list-style-type: none"> o Fluid fraction (any RCP running) - GREATER THAN 84% 	b. Start SI pump(s) to restore RVLIS level (no RCPs) or fluid fraction (any RCP running) and go to Step 14.
c.	Core exit T/Cs - STABLE OR DECREASING	c. Start SI pump(s) to stabilize or decrease core exit T/Cs.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check RCS Hot Leg Temperatures - STABLE	Control steam dump (or ARVs) and total feed flow to stabilize RCS temperature.
15	Initiate Evaluation Of Plant Status:	
	a. Attempt to identify and isolate RCS break	
	b. Check AUX BLDG radiation - NORMAL	b. Attempt to identify and isolate leakage to AUX BLDG (Refer to AP-RCS.1, REACTOR COOLANT LEAK).
	<ul style="list-style-type: none"> • Plant vent iodine (R-10B) • Plant vent particulate (R-13) • Plant vent gas (R-14) • CCW liquid monitor (R-17) • CHG pump room (R-4) 	
	c. Direct RP to obtain the following samples:	
	<ul style="list-style-type: none"> • RCS boron • RCS activity • CNMT hydrogen • CNMT sump 	
	d. Evaluate and operate equipment as necessary:	
	<ul style="list-style-type: none"> • CCW pumps • SW pumps • Charging pumps • CNMT RECIRC fans • Steam dump/ARVs • VCT makeup system 	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Reset SI	
17	Reset CI:	
	a. Depress CI reset pushbutton	
	b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	
18	Verify Adequate Service Water Flow:	
	a. Check at least two SW pumps - RUNNING	a. Manually start pumps as power supply permits (257 kw each).
	b. SW header pressure - GREATER THAN 40 PSIG IN EACH LOOP	b. Manually align valves to restore SW pressure greater than 40 psig in each loop. (Refer to AP-SW.2, LOSS OF SERVICE WATER)

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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19 Establish IA To CNMT:

- a. Verify non-safeguards busses energized from offsite power
 - o Bus 13 normal feed - CLOSED
 - OR-
 - o Bus 15 normal feed - CLOSED

- a. Restore IA supply as follows:

- 1) IF electric air compressor is desired, THEN perform the following:

- a) Close non-safeguards bus tie breakers:

- Bus 13 to Bus 14 tie
- Bus 15 to Bus 16 tie

- b) Verify adequate emergency D/G capacity to run air compressors (75 kw each).

IF NOT, THEN evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).

- c) WHEN bus 15 restored, THEN reset control room lighting.

- d) Go to step 19b.

- 2) IF diesel air compressor is desired, THEN restore IA supply using the diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)

- b. Verify turbine building SW isolation valves - OPEN
 - MOV-4613 and MOV-4670
 - MOV-4614 and MOV-4664

- b. Manually align valves.

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 19 continued from previous page)

c. Verify adequate air
compressor(s) - RUNNING

c. Manually start air compressors as power supply permits (75 kw each). IF air compressors can NOT be started, THEN dispatch A0 to locally reset compressors as necessary.

IF electric air compressor can NOT be started, THEN use diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)

d. Check IA supply:

- o Pressure - GREATER THAN 60 PSIG
- o Pressure - STABLE OR INCREASING

d. Perform the following:

- 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).
- 2) Continue with Step 20. WHEN IA restored, THEN do Steps 19e and f.

e. Reset both trains of XY relays for IA to CNMT AOV-5392

f. Verify IA to CNMT AOV-5392 - OPEN

20 Check PRZR PORV Block Valves:

a. Power to PORV block valves - AVAILABLE

a. Restore power to block valves unless block valve was closed to isolate an open PORV:

- MOV-515, MCC D position 6C
- MOV-516, MCC C position 6C

b. Block valves - AT LEAST ONE OPEN

b. Open one block valve unless it was closed to isolate an open PORV.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRESSURE, THEN STEP 21 SHOULD BE PERFORMED AFTER PRESSURE DECREASES TO LESS THAN THE APPLICABLE PORV SETPOINT.

21 Monitor PRZR PORV Status:

- | | |
|---|--|
| a. Check Reactor Vessel
overpressure protection system -
IN SERVICE | a. Go to Step 21d. |
| b. Check RCS pressure - LESS THAN
410 PSIG | b. Verify at least one PRZR PORV
open. Continue with Step 22.
<u>WHEN</u> pressure less than
setpoint, <u>THEN</u> do Step 21e. |
| c. Go to Step 21e | |
| d. Check PRZR pressure - LESS THAN
2335 PSIG | d. Verify at least one PRZR PORV
open. Continue with Step 22.
<u>WHEN</u> pressure less than
setpoint, <u>THEN</u> do Step 21e. |
| e. Verify PRZR PORVs - CLOSED | e. Manually close PORVs. <u>IF</u> any
PORV can <u>NOT</u> be closed, <u>THEN</u>
manually close its block valve. |

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES IN AN UNCONTROLLED MANNER TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT], THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.

***22 Monitor If RHR Pumps Should Be Stopped:**

- | | |
|---|-------------------|
| a. RHR Pump running in injection mode | a. Go to Step 23. |
| b. Check RCS pressure: | b. Go to Step 23. |
| 1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT] | |
| 2) Pressure - STABLE OR INCREASING | |
| c. Stop RHR pumps and place AUTO | |

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

23 Monitor S/G Levels:

- | | |
|---|---|
| <p>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</p> <p>b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%</p> | <p>a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 17% [25% adverse CNMT] in at least one S/G.</p> <p>b. <u>IF</u> narrow range level in any S/G continues to increase, <u>THEN</u> stop feed to that S/G.</p> |
|---|---|

24 Check If RCS Overpressure Protection Should Be Placed In Service:

- | | |
|--|--------------------------|
| <p>a. Check the following:</p> <ul style="list-style-type: none"> o RCS cold leg temperature - LESS THAN 350°F o RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT] <p>b. Place RCS overpressure protection in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)</p> | <p>a. Go to Step 25.</p> |
|--|--------------------------|

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

25 Check core exit T/Cs -
GREATER THAN 200°F

Go to Step 27.

NOTE: Shutdown margin should be monitored during RCS cooldown (Refer to FIG-2.0, FIGURE SDM).

26 Initiate RCS Cooldown To Cold
Shutdown:

a. Maintain cooldown rate in RCS
cold legs - LESS THAN 100°F/HR

b. Use RHR system if in service

c. Dump steam to condenser from S/Gs

c. Manually or locally dump steam
using S/G ARVs.

27 Check RCS Subcooling Based On
Core Exit T/Cs - GREATER THAN
0°F USING FIG-1.0, FIGURE MIN
SUBCOOLING

Go to Step 46.

28 Check If SI In Service:

Go to Step 38.

o SI pumps - ANY RUNNING

-OR-

o RHR pumps - ANY RUNNING IN
INJECTION MODE

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	Place PRZR Heater Switches In The Following Positions: <ul style="list-style-type: none"> o PRZR proportional heaters - PULL STOP o PRZR backup heaters - OFF 	
30	Check PRZR level - LESS THAN 13% [40% adverse CNMT]	Go to Step 32.
***** <u>CAUTION</u> RCS SUBCOOLING MAY BE LOST TEMPORARILY WHILE PERFORMING DEPRESSURIZATION TO RESTORE PRZR LEVEL. *****		
<p><u>NOTE:</u></p> <ul style="list-style-type: none"> o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves. o <u>WHEN</u> using a PRZR PORV, <u>THEN</u> select one with an operable block valve. 		
31	Depressurize RCS To Refill PRZR: <ul style="list-style-type: none"> a. Depressurize using normal PRZR spray if available b. PRZR level - GREATER THAN 13% [40% adverse CNMT] c. Stop RCS depressurization 	<ul style="list-style-type: none"> a. <u>IF</u> normal spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV. <u>IF</u> <u>IA NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS. <u>IF</u> NO PORV available, <u>THEN</u> use auxiliary spray valve (AOV-296). b. Continue with Step 32. <u>WHEN</u> level greater than 13% [40% adverse CNMT], <u>THEN</u> do Step 31c.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32 Check If An RCP Should Be Started:		
a. Both RCPs - STOPPED		a. Perform the following: 1) Stop all but one RCP. 2) Place spray valve controller for idle RCP in MANUAL at 0% demand. 3) Go to Step 33.
b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING		b. Go to Step 46.
c. PRZR level - GREATER THAN 13% [40% adverse CNMT]		c. Return to Step 30.
d. Try to start an RCP 1) Establish conditions for starting an RCP a) Bus 11A or 11B energized b) Refer to ATT-15.0. ATTACHMENT RCP START 2) Start one RCP		d. <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> perform the following: 1) Ensure at least one control rod shroud fan running (45 kw). 2) Ensure one Rx compartment cooling fan running (23 kw).

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

33 Check RCS Cold Leg
Temperature - GREATER THAN
285°F

Go to Step 37.

CAUTION

IF RHR PUMP SUCTION TEMPERATURE IS GREATER THAN 250°F (PPCS POINT ID T0684A OR T0684B), THEN CONSULT TSC BEFORE STARTING AN RHR PUMP.

34 Check SI Pump Status:

- a. Three SI pumps - RUNNING
- b. RCS subcooling Based on core exit T/Cs - GREATER THAN 35°F [90°F adverse CNMT] using FIG-1.0, FIGURE MIN SUBCOOLING

a. Go to Step 35.

- b. IF RCS hot leg temperature greater than 320°F [310°F adverse CNMT] OR IF RHR normal cooling in service, THEN go to Step 46.

IF RHR normal cooling NOT in service AND RCS hot leg temperature less than 320°F [310°F adverse CNMT], AND RHR pump suction temperature less than 250°F, THEN ensure at least one RHR pump running in injection mode and go to Step 34c. IF no RHR pump can be operated in injection mode, THEN go to Step 46.

- c. PRZR level - GREATER THAN 13% [40% adverse CNMT]

- c. DO NOT stop SI pump. Return to Step 31.

- d. Stop one SI pump

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

35 Check If One Of Two SI Pumps
Should Be Stopped:

a. Two SI pumps - RUNNING

a. Go to Step 36.

b. Determine required RCS
subcooling from table

Charging Pump Availability	RCS Subcooling Criteria
NONE	120°F [200°F adverse CNMT]
ONE	115°F [190°F adverse CNMT]
TWO	105°F [180°F adverse CNMT]
THREE	100°F [175°F adverse CNMT]

c. RCS subcooling based on core
exit T/Cs - GREATER THAN VALUE
FROM TABLE ABOVE USING FIG-1.0.
FIGURE MIN SUBCOOLING

c. IF RCS hot leg temperature
greater than 320°F [310°F
adverse CNMT] OR IF RHR normal
cooling in service, THEN go to
Step 46.

IF RHR normal cooling NOT in
service AND RCS hot leg
temperature less than 320°F
[310°F adverse CNMT], AND RHR
pump suction temperature less
than 250°F, THEN ensure at least
one RHR pump running in
injection mode and go to
Step 35d. IF no RHR pump can be
operated in injection mode,
THEN go to Step 46.

d. PRZR level - GREATER THAN 13%
[40% adverse CNMT]

d. DO NOT stop SI pump. Return to
Step 31.

e. Stop one SI pump

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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36 Check If Last SI Pump Should Be Stopped:

- | | |
|---|-------------------|
| a. Any SI pump - RUNNING | a. Go to Step 38. |
| b. Determine required RCS subcooling from table | |

Charging Pump Availability	RCS Subcooling Criteria
NONE	Insufficient subcooling to stop SI pump.
ONE	255°F [295°F adverse CNMT]
TWO	235°F [285°F adverse CNMT]
THREE	210°F [270°F adverse CNMT]

- | | |
|---|--|
| c. RCS subcooling based on core exit T/Cs - GREATER THAN REQUIRED SUBCOOLING USING FIG-1.0. FIGURE MIN SUBCOOLING | c. <u>IF</u> RCS hot leg temperature greater than 320°F [310°F adverse CNMT] <u>OR IF</u> RHR normal cooling in service, <u>THEN</u> go to Step 46.

<u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperature less than 320°F [310°F adverse CNMT], <u>AND</u> RHR pump suction temperature less than 250°F, <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 36d. <u>IF</u> no RHR pump can be operated in injection mode, <u>THEN</u> go to Step 46. |
| d. PRZR level - GREATER THAN 13% [40% adverse CNMT] | d. DO <u>NOT</u> stop SI pump. Return to Step 31. |
| e. Stop SI pump | |
| f. Go to Step 38 | |

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
37	Check If SI Pump Should Be Stopped:	
	a. Any SI pump - RUNNING	a. Go to Step 38.
	b. RCS pressure - GREATER THAN 295 psig [510 psig adverse CNMT]	b. Go to Step 46.
	c. PRZR level - GREATER THAN 13% [40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Return to Step 31.
	d. Stop one SI pump	
	e. Return to Step 37a	
38	Check If Charging Flow Should Be Controlled To Maintain PRZR Level:	
	a. Check RHR pumps - ANY RUNNING IN INJECTION MODE	a. Start charging pumps and control charging flow to maintain PRZR level and go to Step 39.
	b. Go to Step 46.	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39 Check RCP Status:		
a. RCPs - AT LEAST ONE RUNNING		a. Try to start one RCP 1) Establish conditions for starting an RCP a) Bus 11A or 11B energized b) Refer to ATT-15.0, ATTACHMENT RCP START 2) Start one RCP. <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). <u>IF</u> natural circulation <u>NOT</u> verified, <u>THEN</u> increase dumping steam. 3) Go to Step 40.
b. Stop all but one RCP		

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

DEPRESSURIZING THE RCS MAY RESULT IN LOSING THE MINIMAL RCP #1 SEAL OPERATING CONDITIONS. THIS WILL REQUIRE THE RCPS TO BE TRIPPED.

- NOTE:
- o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.
 - o WHEN using a PRZR PORV, THEN select one with an operable block valve.

40 Depressurize RCS To Minimize
RCS Subcooling:

- a. Depressurize using normal PRZR spray if available

- a. IF normal spray NOT available, THEN use one PRZR PORV. IF IA NOT available, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

IF NO PORV available, THEN use auxiliary spray valve (AOV-296).

- b. Energize PRZR heaters as necessary
- c. Depressurize RCS until EITHER of the following conditions satisfied:
 - o PRZR level - GREATER THAN 75% [65% adverse CNMT]

-OR-

- o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING
- d. Stop RCS depressurization

EOP: AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 28 of 35
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
41	Verify Adequate Shutdown Margin	
	a. Direct RP to sample RCS for boron concentration	
	b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0. FIGURE SDM	b. Borate as necessary.
42	Check If Letdown Can Be Established:	
	a. PRZR level - GREATER THAN 13% [40% adverse CNMT]	a. Go to Step 46.
	b. Charging flow - LESS THAN 20 GPM	b. Go to Step 46.
43	Establish Normal Letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN)	<p><u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess letdown (Refer to ATT-9.1, ATTACHMENT EXCESS L/D)</p> <p><u>IF</u> RCP seal return <u>NOT</u> established, <u>THEN</u> consult TSC to determine if excess letdown should be placed in service.</p>

EOP: AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 29 of 35
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

44 Check VCT Makeup System:

- a. Adjust boric acid flow control valve in AUTO to 9.5 gpm
- b. Adjust RMW flow control valve in AUTO to 40 gpm
- c. Ensure the following:
 - 1) RMW mode selector switch in AUTO
 - 2) RMW control armed - RED LIGHT LIT
- d. Check VCT level:
 - o Level - GREATER THAN 20%
 - OR-
 - o Level - STABLE OR INCREASING
- d. Manually increase VCT makeup flow as follows:
 - 1) Ensure BA transfer pumps and RMW pumps running. IF NOT, THEN reset MCC C and MCC D UV lockouts.
 - 2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow until VCT level greater than 20% OR stable or increasing.

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AP-RCS.4	SHUTDOWN LOCA	PAGE 30 of 35

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

45 Check Charging Pump Suction
Aligned To VCT:

a. VCT level - GREATER THAN 20%

a. IF VCT level can NOT be maintained greater than 5%. THEN perform the following:

1) Ensure charging pump suction aligned to RWST

o LCV-112B open

o LCV-112C closed

2) Continue with Step 46. WHEN VCT level greater than 40%. THEN do Step 45.

b. Align charging pumps to VCT

o LCV-112C - OPEN

o LCV-112B - CLOSED

***46 Monitor RCS Inventory:**

a. Check the following:

o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

o PRZR level - GREATER THAN 5% [30% adverse CNMT]

b. Go to Step 48

a. Perform the following:

1) Manually operate SI pumps to restore inventory and/or subcooling. DO NOT operate more than two SI pumps.

2) Go to Step 47.

EOP. AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 31 of 35
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

47 Verify Adequate SI Flow:

a. Check RVLIS - AVAILABLE

a. IF PRZR level greater than 5% [30% adverse CNMT] and stable or increasing. THEN go to Step 47c. IF NOT, THEN start SI pumps as necessary to restore PRZR level to greater than 5% [30% adverse CNMT] and stable or increasing and go to Step 48.

b. Check RVLIS indication:

- o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]

b. Start SI pumps as necessary to restore RVLIS level (no RCPs) or fluid fraction (any RCP running) and go to Step 48.

-OR-

- o Fluid fraction (any RCP running) - GREATER THAN 84%

c. Core exit T/Cs - STABLE OR DECREASING

c. Start SI pumps as necessary to stabilize or decrease core exit T/Cs.

48 Check If Emergency D/Gs Should Be Stopped:

a. Verify AC emergency busses energized by offsite power:

- o Emergency D/G output breakers - OPEN
- o AC emergency bus voltage - GREATER THAN 420 VOLTS
- o AC emergency bus normal feed breakers - CLOSED

a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)

EOP: AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 32 of 35
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
49	Check RCP Cooling:	Establish normal cooling to RCPs (Refer to ATT-15.2, ATTACHMENT SEAL COOLING).
	a. Check CCW to RCPs	
	o Annunciator A-7, RCP A CCW RETURN HIGH TEMPERATURE OR LOW FLOW - EXTINGUISHED	
	o Annunciator A-15, RCP B CCW RETURN HIGH TEMPERATURE OR LOW FLOW - EXTINGUISHED	
	b. Check RCP seal injection	
	o Labyrinth seal D/P - GREATER THAN 15 INCHES	
	o RCP seal injection flow - GREATER THAN 6 GPM	

EOP. AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 33 of 35
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
50	Check If Seal Return Flow Should Be Established:	
a.	Verify instrument bus D - ENERGIZED	a. Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
b.	Verify RCP #1 seal outlet temperature - LESS THAN 235°F	b. Go to Step 51.
c.	Verify RCP SEAL DISCH VLVS - OPEN <ul style="list-style-type: none"> • AOV-270A • AOV-270B 	
d.	Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
e.	Open RCP seal return isolation valve MOV-313	e. Perform the following: <ol style="list-style-type: none"> 1) Place MOV-313 switch to open. 2) Dispatch AO to locally open MOV-313.
f.	Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM	f. Perform the following: <ol style="list-style-type: none"> 1) Trip the affected RCP 2) Allow 4 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve. <ul style="list-style-type: none"> • RCP A, AOV-270A • RCP B, AOV-270B <p><u>IF</u> both RCP SEAL DISCH VLVS closed, <u>THEN</u> go to Step 51</p>
g.	Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	g. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

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AP-RCS.4	SHUTDOWN LOCA	PAGE 34 of 35

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in step 51.

51 Check CNMT Hydrogen Concentration:

- a. Direct RP to start CNMT hydrogen monitors as necessary
- b. Hydrogen concentration - LESS THAN 0.5%
- b. Consult TSC to determine if hydrogen recombiners should be placed in service.

52 Check If Normal RHR Cooling Can Be Established:

- a. Check the following:
 - o RCS cold leg temperature - LESS THAN 350°F
 - o RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]
- a. Go to Step 53.
- b. Place RCS overpressure protection in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)
- c. Consult plant staff to determine if RHR normal cooling should be established using ATT-14.1, ATTACHMENT RHR COOL

EOP. AP-RCS.4	TITLE. SHUTDOWN LOCA	REV: 14 PAGE 35 of 35
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
53	Check core exit T/Cs - LESS THAN 200°F	Return to Step 22.
54	Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult plant staff	
	<u>NOTE:</u> Refer to 0-9.3. NRC IMMEDIATE NOTIFICATION, for reporting requirements.	
55	Notify Higher Supervision	
	-END-	

EOP: AP-RCS.4	TITLE: SHUTDOWN LOCA	REV: 14 PAGE 1 of 1
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AP-RCS.4 APPENDIX LIST

TITLE

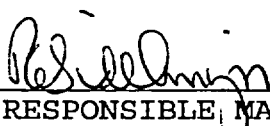
- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) FIGURE SDM (FIG-2.0)
- 3) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 4) ATTACHMENT RHR COOL (ATT-14.1)
- 5) ATTACHMENT RCP START (ATT-15.0)
- 6) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 7) ATTACHMENT NC (ATT-13.0)
- 8) ATTACHMENT SEAL COOLING (ATT-15.2)
- 9) ATTACHMENT D/G STOP (ATT-8.1)
- 10) ATTACHMENT N2 PORVS (ATT-12.0)
- 11) ATTACHMENT CI/CVI (ATT-3.0)
- 12) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2) |
- 13) ATTACHMENT EXCESS L/D (ATT-9.1) |
- 14) ATTACHMENT LETDOWN (ATT-9.0) |

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 1 of 14
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

4-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 2 of 14
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A. PURPOSE - This procedure provides guidance in the event of a loss of RHR cooling at or above normal loop levels. (i.e. RCS loop levels of 64 inches or greater)

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from;

- a. FR-C.3, RESPONSE TO SATURATED CORE COOLING, or
- b. AP-ELEC.3, LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350°F), when RHR flow can NOT be restored, or
- c. AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN when CCW is inadequate for RHR cooling

2. SYMPTOMS - The following are symptoms of LOSS OF RHR;

- a. No RHR pumps running, or
- b. Annunciator A-20, RESIDUAL HEAT REMOVAL LOOP LO FLOW 2900 GPM (Set at 400 GPM per 0-2.2 in RHR Cooling mode), lit, or
- c. Unexpected increase in temperature while on RHR cooling, or
- d. Erratic or no flow on FI-626, RHR Loop Flow, or
- e. Annunciator J-9, SAFEGUARD BREAKER TRIP, lit.

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 3 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).</p>		
1	Check PRZR Wide Range Level - GREATER THAN 0 INCHES	<p><u>IF</u> RCS loop level indicator in service and loop level less than 64 inches, <u>THEN</u> go to AP-RHR.2. LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS.</p>
2	Check RHR Pumps - AT LEAST ONE RUNNING	<p><u>IF</u> running pump tripped due to loss of NPSH, <u>THEN</u> go to step 4.</p> <p><u>IF NOT</u>, <u>THEN</u> go to step 10.</p>

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 4 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF BOTH RHR PUMPS RUNNING WITH DISCHARGE CROSSTIES OPEN, THEN TOTAL RHR FLOW SHOULD BE MAINTAINED GREATER THAN 1200 GPM.</p> <p>*****</p>		
3	Check If RHR Pump(s) Should Be Stopped:	
a.	RHR pump - ANY RUNNING	a. Go to Step 4.
b.	Check RHR pump flow - LESS THAN 1500 GPM PER OPERATING PUMP	b. Manually decrease RHR flow to less than 1500 gpm per operating pump. <u>IF</u> RHR flow can <u>NOT</u> be controlled from the MCB, <u>THEN</u> perform the following: <ol style="list-style-type: none"> 1) Stop running RHR pump. 2) Dispatch an AO with a locked valve key to locally close RHR Hx outlet valves. <ul style="list-style-type: none"> • A RHR Hx, HCV-625 handwheel • B RHR Hx, HCV-624 handwheel 3) Start an RHR pump. 4) Direct AO to locally adjust RHR flow to less than 1500 gpm.
c.	RHR pumps cavitating: <ol style="list-style-type: none"> o RHR pump flow - OSCILLATING -OR- o RHR pump NPSH - APPROXIMATELY ZERO (PPCS Group Display NPSH) 	c. Go to Step 19.
d.	Stop RHR pumps.	

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 5 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

- o DO NOT INITIATE ANY ACTIONS WHICH MAY ADD POSITIVE REACTIVITY TO THE CORE.
- o NOTIFY S/G OFFICE THAT CNMT BREATHING AIR MAY BE LOST.
- o IF REFUELING IN PROGRESS, THEN STOP REFUELING OPERATIONS (NOTIFY REFUELING SRO).

NOTE: Personnel remaining in CNMT to assist in event mitigation should consult Health Physics for changes in radiological concerns.

4 Initiate Actions To Protect
Personnel In CNMT:

- | | |
|---|---|
| a. Evacuate non-essential personnel from CNMT | b. Manually start available CNMT RECIRC fans. |
| b. Verify all available CNMT RECIRC fan(s) - RUNNING | c. Refer to appropriate alarm response procedures for required actions. |
| c. Initiate monitoring of CNMT area and process radiation monitors | d. Within 4 hours, close all CNMT penetrations to outside atmosphere. |
| d. Verify CNMT penetrations with direct access to outside atmosphere - CLOSED (Refer to ATT-3.1, ATTACHMENT CNMT CLOSURE) | |

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 6 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<u>CAUTION</u>		
SYSTEM MAY BE PRESSURIZED. EXTRA CARE SHOULD BE EXERCISED WHEN OPERATING THE RHR VENT VALVE.		

<u>NOTE:</u> If adequate time to completely vent the RHR system is not available, then air can be swept out of the RHR lines by running an RHR pump at a flowrate between 1200 gpm and 1400 gpm.		
5 Vent RHR System As Necessary		
a. Check vent hose at RHR suction V-2764 - INSTALLED		a. Go to step 6.
b. Check RCS temperature - LESS THAN 200°F		b. Go to step 6.
c. Maintain RCS level while venting RHR system		
d. Direct AO to vent RHR suction line from loop A at V-2764 (in CNMT by loop A)		
6 Check RHR Cooling Valve Alignment - NORMAL (Refer to ATT-14.0, ATTACHMENT NORMAL RHR COOLING)		Manually or locally align valves as necessary.

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 7 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>THE RHR HX OUTLET VALVES (HCV-624 AND HCV-625) WILL FAIL OPEN ON LOSS OF INSTRUMENT AIR PRESSURE.</p> <p>*****</p>		
7	<p>Check IA Available For RHR Flow Control:</p> <ul style="list-style-type: none"> o Verify adequate air compressors - RUNNING o Verify IA pressure - GREATER THAN 60 PSIG o IA available to HCV-624 <u>AND</u> HCV-625 	<p>Perform the following:</p> <ul style="list-style-type: none"> a. Manually start adequate air compressors (75 kw each). <u>IF</u> air compressors can <u>NOT</u> be started manually, <u>THEN</u> dispatch AO to locally reset and start compressors (75 kw each). <u>IF</u> electric air compressor(s) can <u>NOT</u> be restored, <u>THEN</u> start diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) b. <u>IF</u> IA pressure can <u>NOT</u> be restored, <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) Dispatch AO with a locked valve key to locally close RHR Hx outlet valves. <ul style="list-style-type: none"> • A RHR Hx, HCV-625 handwheel • B RHR Hx, HCV-624 handwheel 2) <u>WHEN</u> conditions permit, <u>THEN</u> refer to AP-IA.1, LOSS OF INSTRUMENT AIR, to restore IA.

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 8 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 8 Monitor RCS Temperature - GREATER THAN 200°F		<p>Perform the following:</p> <ul style="list-style-type: none"> a. Notify Plant Staff to attempt to establish CNMT integrity <u>AND</u> CNMT heat removal capability. b. Go to step 10.
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> o CHANGES IN RCS PRESSURE COULD RESULT IN INACCURACIES IN RCS LOOP LEVEL INDICATION o UNSTABLE OR FLUCTUATING LEVEL INSTRUMENTS SHOULD NOT BE RELIED ON FOR INDICATION OF RCS INVENTORY. <p>*****</p>		
9 Verify RCS Intact:		<p>Perform the following:</p> <ul style="list-style-type: none"> o PRZR level - GREATER THAN 5% AND STABLE o RCS pressure - STABLE o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING o RCS vent paths - CLOSED <ul style="list-style-type: none"> a. Verify charging line flow control valve, HCV-142, open as necessary. b. Ensure charging line valve to loop B cold leg, AOV-294, open. c. Start charging pumps as necessary. d. Control charging pump speed and letdown flow to stabilize RCS conditions. <ul style="list-style-type: none"> • PRZR pressure • PRZR level • Loop level <p><u>IF</u> charging flow greater than 75 gpm with letdown isolated <u>OR</u> unable to verify RCS inventory, <u>THEN</u> go to AP-RCS.4, SHUTDOWN LOCA.</p>

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 9 of 14
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10 Establish Conditions To Start RHR Pump:

a. RHR pump - AVAILABLE

a. Perform the following:

- 1) Start trending core exit TCs .
- 2) IF RCS closed, THEN go to Step 12. IF RCS open to atmosphere, THEN go to Step 18.

b. Verify CCW cooling to RHR system in service

b. Perform the following:

- o CCW pumps - ENSURE AT LEAST ONE RUNNING
- o CCW to RHR Hxs. MOV-738A AND MOV-738B - ADJUSTED TO OBTAIN DESIRED COOLING
- o Check CCW flow \leq 4900 gpm (FI-619)

- 1) Increase SW from CCW Hx
 - CCW Hx A. V-4619
 - CCW Hx B. V-4620
- 2) Adjust MOV-738A and MOV-738B to obtain desired cooling.
- 3) IF > 4900 gpm CCW flow required for desired RHR cooling, THEN notify the Shift Supervisor.

IF CCW can NOT be restored, THEN continue with Step 11 while attempting to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).

c. Close RHR pump flow control valves (controllers at 100% demand)

- HCV-624
- HCV-625

d. Place RHR Hx bypass valve, HCV-626, to MANUAL and close valve

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 10 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>STARTING AN RHR PUMP MAY RESULT IN AN RCS LEVEL OR PRESSURE DECREASE DUE TO SHRINK OR VOID COLLAPSE.</p> <p>*****</p>		
11	Restore RHR Flow:	
	a. Start one RHR pump - RHR PUMP RUNNING	a. Go to Step 11e.
	b. Check RHR flow - LESS THAN 1500 GPM PER PUMP	b. Manually adjust RHR flow to less than 1500 gpm per pump.
	c. Adjust RHR Hx bypass flow control valve, HCV-626, to desired flowrate	
	d. Place RHR Hx bypass flow control valve, HCV-626, controller in AUTO	
	e. RHR flow - RESTORED	e. Perform the following:
		1) Start trending core exit T/Cs.
		2) <u>IF</u> RCS closed, <u>THEN</u> go to Step 12. <u>IF</u> RCS vented to atmosphere, <u>THEN</u> go to Step 18.
	f. Adjust RHR Hx outlet valves to control RCS temperature	
	<ul style="list-style-type: none"> • HCV-624 • HCV-625 	

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 11 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12 Monitor RCS Temperature:		
a. RCS temperature - STABLE OR DECREASING		a. <u>IF</u> RCS closed, <u>THEN</u> go to Step 13. <u>IF</u> RCS open to atmosphere, <u>THEN</u> go to Step 18.
b. Go to Step 21		
13 Check Any S/G Level - GREATER THAN 17%		Verify at least 200 gpm AFW flow available. <u>IF NOT</u> , <u>THEN</u> go to Step 19.
14 Check RCS Pressure - GREATER THAN 300 PSIG		Increase RCS pressure to greater than 300 psig. <u>IF</u> RCS pressure can <u>NOT</u> be increased, <u>THEN</u> go to Step 19.
15 Check RCP Status - ANY RCP RUNNING		Perform the following: a. Establish conditions for starting an RCP. o Verify bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT RCP START. b. Start one RCP. <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation. (Refer to ATT-13.0, ATTACHMENT NC) <u>IF</u> natural circulation <u>NOT</u> verified, <u>THEN</u> increase dumping steam.

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 12 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Establish Condenser Steam Dump Manual Control:	
	<ul style="list-style-type: none"> a. Verify condenser available: <ul style="list-style-type: none"> o Any MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT b. Place condenser steam dump controller HC-484 in MANUAL c. Place steam dump mode selector switch to MANUAL d. Adjust steam dump valves to stabilize RCS temperature 	<ul style="list-style-type: none"> a. Perform the following: <ul style="list-style-type: none"> 1) Place S/G ARV controller in MANUAL and adjust ARVs to stabilize RCS temperature. 2) Go to Step 17.
17	Monitor RCS Temperature:	
	<ul style="list-style-type: none"> a. RCS temperature - STABLE OR DECREASING 	<ul style="list-style-type: none"> a. <u>IF</u> dumping steam does <u>NOT</u> provide adequate cooling, <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) Initiate S/G blowdown from both S/Gs. 2) Maintain both S/G levels stable by controlling AFW flow. 3) Go to Step 19.
	<ul style="list-style-type: none"> b. Go to Step 20 	

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 13 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18 Check RCS Conditions:		
a. Rx vessel head - REMOVED		a. Go to Step 19.
b. Stop refueling operations if in progress		
c. Verify Refueling Cavity Level - GREATER THAN 23 FEET ABOVE VESSEL FLANGE		c. Increase refueling cavity level to greater than 23 feet (Refer to 0-15.3, FILLING REFUELING CANAL).
d. Verify refueling cavity sweep fans - RUNNING		d. Locally start refueling cavity sweep fans if available.
19 Check CCW System Operation:		To restore CCW cooling to RHR Hxs, perform the following:
o CCW pumps - AT LEAST ONE RUNNING		a. Ensure the standby CCW pump is running.
o RCS temperature - STABLE OR DECREASING		b. Increase SW from CCW Hx <ul style="list-style-type: none"> • CCW Hx A, V-4619 • CCW Hx B, V-4620
o Annunciator A-21, COMP COOLING HX OUT HI TEMP - EXTINGUISHED		c. Adjust MOV-738A and MOV-738B to maintain RCS temperature stable or decreasing.
o Annunciator A-22, CCW PUMP DISCHARGE LO PRESS - EXTINGUISHED		d. <u>IF</u> > 4900 gpm CCW flow required for desired RHR cooling (FI-619). <u>THEN</u> notify the Shift Supervisor.
o Annunciator A-30, CCW PUMP INLET HEADER HI TEMP - EXTINGUISHED		
o CCW flow \leq 4900 gpm (FI-619)		<u>IF</u> CCW can <u>NOT</u> be restored, <u>THEN</u> continue attempts to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 14 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> Consult with Plant Staff to determine alternatives for long term cooling.</p>	
20	Monitor RHR Cooling:	Perform the following:
	<ul style="list-style-type: none"> o RHR cooling - RESTORED o RCS temperature - STABLE OR DECREASING 	<ul style="list-style-type: none"> a. Evaluate alternatives for long term cooling (Consult Plant Staff) <ul style="list-style-type: none"> • Consider establishing secondary heat sink • Refer to ER-RHR.1. RCDT PUMP OPERATION FOR CORE COOLING • Consider RCS feed and bleed b. Continue attempts to restore RHR to operable. c. Return to Step 2.
21	Evaluate MCB Annunciator Status (Refer to AR Procedures)	
	<p><u>NOTE:</u> Refer to 0-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.</p>	
22	Notify Higher Supervision	
23	Return to Procedure Or Guidance In Effect	
	-END-	

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 19 PAGE 1 of 1
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AP-RHR.1 APPENDIX LIST

TITLE

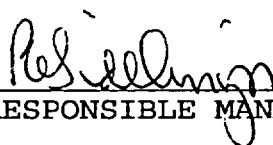
- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) ATTACHMENT NORMAL RHR COOLING (ATT-14.0)
- 3) ATTACHMENT RCP START (ATT-15.0)
- 4) ATTACHMENT NC (ATT-13.0)
- 5) ATTACHMENT CNMT CLOSURE (ATT-3.1)
- 6) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 1 of 17
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23


RESPONSIBLE MANAGER

4-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 2 of 17
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A. PURPOSE - This procedure provides guidance necessary for maintaining core cooling and protecting the reactor core in the event that RHR cooling is lost during RCS reduced inventory operation, (i.e., at indicated Loop Levels of less than 64 inches with fuel in the vessel).

B. ENTRY CONDITIONS/SYMPTOMS

1. SYMPTOMS - The following symptoms are indicative of LOSS OF RHR AT RCS REDUCED INVENTORY CONDITIONS:

- a. No RHR pumps running, or
- b. Annunciator A-20, RESIDUAL HEAT REMOVAL LOOP LO FLOW 2900 GPM (Set at 400 GPM per 0-2.2 in RHR Cooling mode) lit, or
- c. Unexpected increase in RCS temperature while on RHR cooling at low loop levels, or
- d. Erratic or no flow on FI-626

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 3 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o CHANGES IN RCS PRESSURE COULD RESULT IN INACCURACIES IN RCS LOOP LEVEL INDICATIONS.</p> <p>o SHOULD CORE BOILING OCCUR, "SURGE LINE FLOODING" MAY RESULT IN RCS PRESSURIZATION AND ERRONEOUS HIGH LOOP LEVEL INDICATION.</p> <p>o IA TO CNMT MAY BE REQUIRED FOR RCS MAKEUP AND SHOULD NOT BE ISOLATED UNTIL DIRECTED BY THIS PROCEDURE.</p> <p>*****</p> <p><u>NOTE:</u> Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).</p> <p>1 Check If RCS Draindown Should Be Stopped:</p> <p style="margin-left: 40px;">a. Check RCS draindown - IN PROGRESS a. Go to step 2.</p> <p style="margin-left: 40px;">b. Stop draining RCS (Refer to O-2.3.1. DRAINING AND OPERATION AT REDUCED INVENTORY OF THE REACTOR COOLANT SYSTEM)</p> <p>2 Check RHR Pumps - AT LEAST ONE RUNNING</p> <p style="margin-left: 400px;"><u>IF</u> the running pump has tripped due to loss of NPSH, <u>THEN</u> go to step 3.</p> <p style="margin-left: 400px;"><u>IF NOT</u>, <u>THEN</u> go to step 17. </p>		

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 4 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Initiate CNMT Closure (Refer to O-2.3.1A, CONTAINMENT CLOSURE CAPABILITY IN TWO HOURS DURING RCS REDUCED INVENTORY OPERATION)	
4	Check If RHR Pumps Should Be Stopped:	
	a. RHR pump - ANY RUNNING	a. Go to Step 5.
	b. Check RCS level:	b. Stop RHR pumps and go to Step 5.
	o Level - GREATER THAN 6 INCHES	
	o Level - STABLE	
	c. RHR flow - LESS THAN 500 GPM	c. Perform the following:
		1) <u>IF</u> BOTH RHR pumps running with discharge crossties open, <u>THEN</u> stop one RHR pump.
		2) Reduce RHR flow to less than 500 gpm.
	d. RHR pumps cavitating:	d. Go to Step 20.
	o RHR pump flow - OSCILLATING	
	-OR-	
	o RHR pump NPSH - APPROXIMATELY ZERO (PPCS Group Display NPSH)	
	e. Stop RHR pumps	

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT, RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 5 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Isolate Letdown And Known Drain Paths	
	<p>a. Verify the following valves - CLOSED</p> <ul style="list-style-type: none"> • RCDT pump suctions from sump B, MOV-1813A and MOV-1813B • Letdown isolation, AOV-427 • Low pressure letdown pressure control valve, PCV-135 • RHR letdown flow control valve, HCV-133 • Excess letdown isolation valve, AOV-310 <p>b. Evaluate normal drain lineups</p> <p>c. Evaluate maintenance activities affecting RCS or RHR system</p>	a. Manually close valves.
6	Start Available CNMT RECIRC Fans	
	<p><u>NOTE:</u> Personnel remaining in CNMT to assist in event mitigation should consult Radiation Protection for changes in radiological concerns.</p>	
7	Initiate Actions To Protect Personnel In CNMT:	
	<p>a. Evacuate non-essential personnel from CNMT</p> <p>b. Periodically monitor CNMT radiation</p>	

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 6 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o PERSONNEL WORKING IN CNMT SHOULD BE WARNED BEFORE REFILLING THE RCS TO AVOID INADVERTENT CONTAMINATION OF PERSONNEL WORKING NEAR RCS OPENINGS.</p> <p>o THE S/G OFFICE SHOULD BE NOTIFIED BEFORE RAISING LOOP LEVEL.</p> <p>o ONLY BORATED WATER SHOULD BE ADDED TO THE RCS TO MAINTAIN ADEQUATE SDM.</p> <p>*****</p>		
* 8	Check RCS Temp	Go to Step 13.
	o Core Exit TCs - LESS THAN 200°F	
	o No visual steam at RCS vents	
9	Check RCS Loop Level - LESS THAN 30 INCHES	Go to Step 14.

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 7 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> o The next four steps are sequenced to indicate the preferred order of RCS refill methods if core boiling is not occurring.</p> <p> o Gravity feed through MOV-856 is expected at approximately 12 turns open.</p>		
10	Refill The RCS By Gravity Feed From The RWST	
	a. Dispatch AO to locally throttle open RHR pump suction from RWST. MOV-856	
	b. Close RHR pump discharge valve to loop B cold leg. MOV-720	
	c. Verify MOV-856 indicates midposition	c. Perform the following: 1) Open MOV-720. 2) Go to Step 11.
	d. Verify RCS loop level - INCREASING AS EXPECTED	d. Perform the following: 1) Close MOV-856. 2) Open MOV-720. 3) <u>IF</u> RCS loop level greater than 6 inches. <u>THEN</u> go to Step 11. <u>IF NOT</u> . <u>THEN</u> go to Step 13.
	e. Check RCS loop level - GREATER THAN 30 INCHES	e. Continue filling RCS. <u>WHEN</u> RCS loop level greater than 30 inches. <u>THEN</u> do Steps 10f through h.
	f. Manually close MOV-856	f. Direct AO to locally close valve.
	g. Open RHR pump discharge valve to B loop cold leg. MOV-720	g. <u>IF</u> MOV-720 does <u>NOT</u> open. <u>THEN</u> open core deluge valves MOV-852A and MOV-852B.
	h. Go to Step 14	

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 8 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Refill The RCS By Charging To B Loop Cold Leg:	
	a. Verify IA to CNMT, AOV-5392 - OPEN	a. Manually open valve.
	b. Open and verify open charging line valve to loop B cold leg, AOV-294	b. Open alternate charging line to loop A cold leg, AOV-392B, and go to Step 11d.
	c. Ensure HCV-142 demand at 0%	
	d. Start operable charging pump and increase flow to maximum	
	e. Verify charging flow - GREATER THAN ZERO	e. Perform the following: 1) Stop operating charging pump. 2) Close AOV-294. 3) Go to Step 12.
	f. Verify RCS loop level - INCREASING AS EXPECTED	f. Perform the following: 1) Open or verify open alternate charging line to loop A cold leg, AOV-392B. 2) Close AOV-294. 3) Verify loop level increasing as expected. <u>IF NOT, THEN</u> perform the following: a) Stop operating charging pump. b) Close AOV-392B. c) Close IA to CNMT, AOV-5392. d) Go to Step 12.
	g. Check RCS loop level - GREATER THAN 30 INCHES	g. Continue filling RCS. <u>WHEN</u> loop level greater than 30 inches, <u>THEN</u> do Steps 11h through j.
	h. Stop running charging pump	
	i. Close or verify closed charging line valve to loop B cold leg, AOV-294 and AOV-392B	
	j. Go to Step 14	

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 9 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Refill RCS Using SI Pumps To Cold Legs:	
a.	Open the appropriate SI pump discharge valves to loop cold legs <ul style="list-style-type: none"> • A SI Pump - MOV-878B • B SI Pump - MOV-878D • C SI Pump - MOV-878B AND/OR MOV-878D 	a. Ensure at least one valve open. <u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to check breakers. <ul style="list-style-type: none"> • MOV-878B, MCC D position 8C • MOV-878D, MCC D position 8F
b.	Open SI pump suction valves from RWST <ul style="list-style-type: none"> • MOV-825A • MOV-825B 	b. Ensure at least one valve open. <u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to check breakers. <ul style="list-style-type: none"> • MOV-825A, MCC C position 9J • MOV-825B, MCC D position 9J
c.	Start operable SI pump	
d.	Verify the following: <ul style="list-style-type: none"> o SI flow - GREATER THAN ZERO o RCS loop level - INCREASING AS EXPECTED 	d. Perform the following: <ol style="list-style-type: none"> 1) Stop operating SI pump. 2) Close loop cold leg inlet valves. <ul style="list-style-type: none"> • MOV-878B • MOV-878D 3) Go to step 13.
e.	Check RCS loop level - GREATER THAN 30 INCHES	e. Continue filling RCS. <u>WHEN</u> loop level greater than 30 inches, <u>THEN</u> do steps 12f through h.
f.	Stop running SI pump	
g.	Close SI discharge valves to loop cold legs. MOV-878B and MOV-878D	
h.	Go to Step 14	

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 10 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> SI Pump makeup should not be secured when core boiling is indicated.</p> <p>13 Refill RCS Using SI Pumps To Hot Legs:</p>		
a.	Open the appropriate SI pump discharge valves to loop hot legs <ul style="list-style-type: none"> • A SI Pump - MOV-878A • B SI Pump - MOV-878C • C SI Pump - MOV-878A AND/OR MOV-878C 	a. Ensure at least one valve open. <u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to check breakers. <ul style="list-style-type: none"> • MOV-878A, MCC C position 8C • MOV-878C, MCC C position 8F
b.	Open SI pump suction valves from RWST <ul style="list-style-type: none"> • MOV-825A • MOV-825B 	b. Ensure at least one valve open. <u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to check breakers. <ul style="list-style-type: none"> • MOV-825A, MCC C position 9J • MOV-825B, MCC D position 9J
c.	Start operable SI pump	
d.	Verify the following: <ul style="list-style-type: none"> o SI flow - GREATER THAN ZERO o RCS loop level - INCREASING AS EXPECTED 	d. Perform the following: <ol style="list-style-type: none"> 1) Stop operating SI pump. 2) Close loop hot leg inlet valves. <ul style="list-style-type: none"> • MOV-878A • MOV-878C 3) Ensure makeup flow is initiated <ul style="list-style-type: none"> • Gravity feed from RWST • Charging pumps • SI pumps to cold legs • VCT overpressure • RWST purification pump
e.	Operate SI Pump as necessary to maintain the following parameters: <ul style="list-style-type: none"> o Core Exit TC's - LESS THAN 200°F o No visual steam at RCS vents o RCS loop level - GREATER THAN 30 INCHES 	e. <u>IF</u> core exit TC's continue to increase, <u>THEN</u> return to Step 11 to establish additional charging or SI flow to the RCS cold legs.

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 11 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Identify And Isolate Any RCS Leakage	
	<p><u>NOTE:</u> If adequate time to completely vent the RHR system is not available, then air can be swept out of the RHR lines by running an RHR pump at a flowrate between 1200 gpm and 1400 gpm.</p>	
15	Vent RHR System As Necessary	
	<p>a. Check RCS temperature - LESS THAN 200°F</p> <p>b. Maintain RCS level while venting RHR system</p> <p>c. Direct AO to vent RHR suction line from loop A at valve V-2764 (in CNMT by loop A)</p>	<p>a. Go to step 16.</p>

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 12 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>THE RHR HX OUTLET VALVES (HCV-624 AND HCV-625) WILL FAIL OPEN ON LOSS OF INSTRUMENT AIR PRESSURE.</p> <p>*****</p>		
16	<p>Check IA Available For RHR Flow Control:</p> <ul style="list-style-type: none"> o Verify adequate air compressors - RUNNING o Verify IA pressure - GREATER THAN 60 PSIG o IA available to HCV-624 AND HCV-625 	<p>Reset and start adequate air compressors (75 kw each).</p> <p><u>IF</u> electric air compressor not available, <u>THEN</u> start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)</p> <p><u>IF</u> IA pressure can <u>NOT</u> be restored, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Dispatch AO with locked valve key to locally close RHR Hx outlet valves <ul style="list-style-type: none"> • A RHR Hx, HCV-625 handwheel • B RHR Hx, HCV-624 handwheel b. <u>WHEN</u> conditions permit, <u>THEN</u> refer to AP-IA.1, LOSS OF INSTRUMENT AIR, to restore IA.

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 13 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Establish Conditions To Start RHR Pump:	
a.	Check RHR cooling valve alignment - NORMAL (Refer to ATT-14.0, ATTACHMENT NORMAL RHR COOLING)	a. Manually or locally align valves as necessary.
b.	Verify CCW cooling to RHR system in service	b. Perform the following:
1)	CCW pumps - ENSURE AT LEAST ONE RUNNING	1) Increase SW from CCW Hx <ul style="list-style-type: none"> • CCW Hx A, V-4619 • CCW Hx B, V-4620
2)	CCW to RHR Hxs, MOV-738A AND MOV-738B - ADJUSTED TO OBTAIN DESIRED COOLING	2) Adjust MOV-738A and MOV-738B to obtain desired cooling.
3)	Check CCW flow \leq 4900 gpm (FI-619)	3) <u>IF</u> $>$ 4900 gpm CCW flow required for desired RHR cooling, <u>THEN</u> notify the Shift Supervisor.
		<u>IF</u> CCW can <u>NOT</u> be restored, <u>THEN</u> continue with step 18 while attempting to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).
c.	Verify the following RCS conditions:	c. Perform the following:
o	Core exit TC's - LESS THAN 200°F	1) Start trending core exit TCs.
o	No visual steam at RCS vents	2) Return to Step 7.
o	RCS loop level - GREATER THAN 30 INCHES	
d.	RHR pump - AVAILABLE	d. Perform the following:
		1) Start trending core exit TCs.
		2) Place RCDT pumps in service (Refer to ER-RHR.1, RCDT OPERATION FOR CORE COOLING).
		3) Return to Step 7.

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 14 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>STARTING AN RHR PUMP MAY RESULT IN AN RCS LEVEL DECREASE DUE TO SHRINK OR VOID COLLAPSE.</p> <p>*****</p>		
18	Restore RHR Flow:	
	<p>a. Close RHR pump flow control valves</p> <ul style="list-style-type: none"> • HCV-624 • HCV-625 <p>b. Place RHR Hx bypass valve, HCV-626, to MANUAL and close valve</p> <p>c. Start one RHR pump</p> <p>d. Ensure RHR flow - LESS THAN 1500 GPM</p> <p>e. Check RCS loop level - GREATER THAN 30 INCHES</p> <p>f. Gradually increase RHR bypass flow to desired flowrate</p> <p>g. RHR flow - RESTORED</p> <p>h. Establish desired RCS cooldown rate</p>	<p>a. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> ensure AO has locally closed RHR Hx outlet valves and go to step 18c.</p> <p>d. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> dispatch AO with locked valve key to locally adjust flow using RHR Hx outlet valves.</p> <ul style="list-style-type: none"> • A RHR Hx, HCV-625 handwheel • B RHR Hx, HCV-624 handwheel <p>e. Establish adequate makeup flow to stabilize RCS loop level at greater than 30 inches.</p> <p>g. Perform the following:</p> <ol style="list-style-type: none"> 1) Start trending core exit T/Cs. 2) Place RCDT pumps in service (Refer to ER-RHR.1, RCDT OPERATION FOR CORE COOLING). 3) Return to Step 7.

EOP:
AP-RHR.2

TITLE:
LOSS OF RHR WHILE OPERATING AT RCS REDUCED
INVENTORY CONDITIONS

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: Consult with Plant Staff to determine alternatives for long term cooling.

19 Establish Stable Plant Conditions:

- | | |
|--|--|
| a. Verify Core Exit TC's - LESS THAN 200°F | a. Continue cooling with RHR. Return to Step 18d. |
| b. Check RCS loop level: <ul style="list-style-type: none">o Level - GREATER THAN 30 INCHESo Level - STABLE | b. <u>IF</u> RCS loop level increasing. <u>THEN</u> reduce makeup rate to stabilize level. <u>IF</u> RCS loop level decreasing. <u>THEN</u> return to Step 10. |
| c. Stop any running SI pump | |
| d. Stop any running charging pump | |
| e. Maintain RCS level stable using RWST gravity feed | e. Initiate makeup to the RCS using either of the following: <ul style="list-style-type: none">o One charging pump at maximum flow |
| | -OR- |
| | o One SI pump |

EOP:

AP-RHR.2

TITLE:

LOSS OF RHR WHILE OPERATING AT RCS REDUCED
INVENTORY CONDITIONS

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

20 Check CCW System Operation:

- o CCW pumps - AT LEAST ONE RUNNING
- o RCS temperature - STABLE OR DECREASING
- o Annunciator A-21, COMP COOLING HX OUT HI TEMP - EXTINGUISHED
- o Annunciator A-22, CCW PUMP DISCHARGE LO PRESS - EXTINGUISHED
- o Annunciator A-30, CCW PUMP INLET HEADER HI TEMP - EXTINGUISHED
- o Check CCW flow \leq 4900 gpm (FI-619)

To restore CCW cooling to RHR Hxs, perform the following:

- a. Ensure the standby CCW pump is running.
- b. Increase SW from CCW Hx
 - CCW Hx A, V-4619
 - CCW Hx B, V-4620
- c. Adjust MOV-738A and MOV-738B to maintain RCS temperature stable or decreasing.

IF > 4900 gpm CCW flow required for desired RHR cooling (FI-619). THEN notify the Shift Supervisor.

IF CCW can NOT be restored, THEN continue attempts to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).

21 Check Core Exit TCs:

- o Temperature - LESS THAN 140°F
- o Temperature - STABLE OR DECREASING

Continue cooling with RHR. Return to Step 18d.

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 17 of 17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Initiate Monitoring of RCS Temperature	
23	Evaluate MCB Annunciator Status (Refer to AR Procedures)	
	NOTE: Refer to 0-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.	
24	Notify Higher Supervision	
25	Return To Procedure Or Guidance In Effect	
	-END-	

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 13 PAGE 1 of 1
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AP-RHR.2 APPENDIX LIST

TITLE

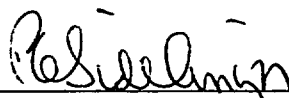
- 1) ATTACHMENT NORMAL RHR COOLING (ATT-14.0)
- 2) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)

EOP: AP-TURB.4	TITLE: LOSS OF CONDENSER VACUUM	REV: 17 PAGE 1 of 11
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

4-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: AP-TURB.4	TITLE: LOSS OF CONDENSER VACUUM	REV: 17 PAGE 2 of 11
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A. PURPOSE - This procedure provides the necessary actions to control the plant with decreasing condenser vacuum.

B. ENTRY CONDITIONS/SYMPTOMS

2. SYMPTOMS - The symptoms of LOSS OF CONDENSER VACUUM are;

- a. Low or decreasing condenser vacuum, or
- b. Annunciator H-7, CONDENSER HI PRESSURE 25.5" HG, lit, or
- c. PPCS high condenser backpressure alarm, or
- d. Unexplained decreasing generator output, or
- e. Annunciator I-18, CONDENSER EXP JOINT A LO LEVEL, or
- f. Annunciator I-19, CONDENSER EXP JOINT B LO LEVEL.

EOP: AP-TURB.4	TITLE: LOSS OF CONDENSER VACUUM	REV: 17 PAGE 3 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	<p>Check Condenser Circulating Water System</p> <ul style="list-style-type: none"> o CW pump discharge valves - BOTH OPEN o CW pumps - BOTH RUNNING 	<p><u>IF</u> a loss of circulating water has occurred, <u>THEN</u> go to AP-CW.1, LOSS OF A CIRC WATER PUMP.</p>

EOP. AP-TURB.4	TITLE. LOSS OF CONDENSER VACUUM	REV: 17 PAGE 4 of 11
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

- o TURBINE LOAD DECREASE SHOULD BE COMPLETED AS QUICKLY AS POSSIBLE WHILE MINIMIZING THE AMOUNT OF STEAM DUMP OPERATION.
- o EXCESSIVE BACK PRESSURE MAY RESULT IN SEVERE TURBINE BLADE VIBRATION. MINIMIZE TIME OUTSIDE THE SATISFACTORY OPERATION REGION.

* 2 Check Condenser Indications:

a. Turbine back pressure - EACH
CONDENSER WITHIN THE
SATISFACTORY OPERATING REGION OF
FIG-13.0, FIGURE BACK PRESSURE

a. IF back pressure is in the DO
NOT OPERATE region for
> 5 minutes, THEN perform the
following:

- o IF power > P-9, THEN trip the
reactor and go to E-0,
REACTOR TRIP OR SAFETY
INJECTION.
- o IF power < P-9, THEN trip the
turbine and go to AP-TURB.1,
TURBINE TRIP WITHOUT RX TRIP
REQUIRED.

IF in the AVOID region, THEN
adjust turbine load to return to
the SATISFACTORY OPERATING
REGION.

b. Condenser vacuum - STABLE OR
IMPROVING

b. WHILE continuing with this
procedure, decrease turbine load
to stabilize condenser vacuum.
(Refer to AP-TURB.5, RAPID LOAD
REDUCTION)

IF condenser vacuum can NOT be
stabilized, THEN perform the
following:

- 1) Decrease turbine load to less
than 15 MW.
- 2) Trip turbine.
- 3) Go to AP-TURB.1, TURBINE TRIP
WITHOUT RX TRIP REQUIRED.

EOP. AP-TURB.4	TITLE: LOSS OF CONDENSER VACUUM	REV: 17 PAGE 5 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Dispatch AO To Perform Local Actions To Attempt To Restore Condenser Vacuum (Refer to ATT-6.0, ATTACHMENT COND VACUUM)	
	<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> o D/P LIMITS ON THE GENERATOR HYDROGEN COOLER AND CONDENSATE COOLER SHOULD NOT BE EXCEEDED (D/P LIMITS INDICATED AT D/P METERS AT MCB REAR). o CLOSELY MONITOR FEED PUMP SUCTION PRESSURE WHEN ADJUSTING CONDENSATE COOLING VALVES. <p>*****</p>	
4	Check Condensate Temperature - LESS THAN 100°F (PPCS point ID T2053)	<p>Perform the following:</p> <ul style="list-style-type: none"> a. Place S/G blowdown and sample valve master isolation switch to CLOSE. b. <u>IF</u> condensate cooler in service. <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) Place generator hydrogen temperature controller in MANUAL at 50%. 2) Dispatch AO to throttle close condensate cooler bypass valve to control condensate temperature. 3) Adjust hydrogen temperature controller and condensate cooler manual bypass valve to establish maximum condensate cooling.

EOP: AP-TURB.4	TITLE: LOSS OF CONDENSER VACUUM	REV: 17 PAGE 6 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Dispatch AO To Check Condenser For Air Inleakage - NO INLEAKAGE DETECTED <ul style="list-style-type: none"> • Vacuum breaker • Condenser boot area • Condenser areas • Blowdown Tank area 	<u>IF</u> condenser inleakage is detected. <u>THEN</u> isolate if possible.
6	Determine If Load Reduction Can Be Stopped: a. Monitor condenser indications: <ul style="list-style-type: none"> o Condenser back pressure - EACH CONDENSER WITHIN THE SATISFACTORY OPERATING REGION OF FIG-13.0, FIGURE BACK PRESSURE o Vacuum - STABLE OR IMPROVING b. Stop the load reduction	a. Return to Step 2.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: With PRZR pressure controller 431K in manual, PORV-431C will not operate in the automatic mode. (Refer to TR 3.4.3)

*** 7 Establish Stable Plant Conditions:**

a. Tavg - TRENDING TO TREF

a. IF Tavg greater than Tref, THEN restore Tavg to Tref by one or more of the following:

- Insert control rods
- RCS boration

IF Tavg less than Tref, THEN restore Tavg to Tref by one or more of the following:

- Withdraw control rods
- Reduce turbine load
- Dilution of RCS

b. PRZR pressure - TRENDING TO 2235 PSIG IN AUTO

b. Control PRZR pressure by one of the following:

- 431K in MANUAL
- Manual control of PRZR heaters and sprays

IF pressure can NOT be controlled manually, THEN refer to AP-PRZR.1, ABNORMAL PRESSURIZER PRESSURE.

c. PRZR level - TRENDING TO PROGRAM IN AUTO CONTROL

c. Perform the following:

- 1) Place affected charging pumps in MANUAL
- 2) Adjust charging pump speed to restore PRZR level to program

IF PRZR level can NOT be controlled manually, THEN refer to AP-RCS.1, REACTOR COOLANT LEAK.

This Step continued on the next page.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 7 continued from previous page)

d. MFW regulating valves -
RESTORING S/G LEVEL TO 52% IN
AUTO

d. Perform the following:

1) Place affected S/G(s) MFW
regulating valve in MANUAL

2) Restore S/G level to 52%

IF S/G level can NOT be
controlled manually, THEN refer
to AP-FW.1, ABNORMAL MAIN
FEEDWATER FLOW.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Establish Normal Plant Operation:	
a.	Check condenser indications	a. Return to Step 2.
	o Condenser pressure - EACH CONDENSER WITHIN THE SATISFACTORY OPERATING REGION OF FIG-13.0, FIGURE BACK PRESSURE	
	o Vacuum - STABLE OR IMPROVING	
b.	Restore EH controls	
	1) Place in OP PAN, IMP OUT	
	2) Place load rate thumbwheel to 10%/hour	
	3) Match setter and reference	
c.	Verify annunciator G-15, STEAM DUMP ARMED - EXTINGUISHED	c. <u>WHEN</u> Tavg within 5°F of Tref, <u>THEN</u> perform the following:
		1) Ensure steam dump valves closed.
		2) Reset steam dump.
d.	Verify one charging pump in AUTO	d. Place one charging pump in AUTO, if desired.
e.	Verify Rods in AUTO	e. Place rods AUTO, if desired.
f.	Verify 431K in AUTO	f. Place 431K in AUTO, if desired.
g.	Verify PRZR spray valves in AUTO	g. Place PRZR spray valves in AUTO, if desired.
This Step continued on the next page.		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 8 continued from previous page)	
	h. Verify PRZR heaters restored:	h. Restore PRZR heaters, if desired.
	o PRZR proportional heaters breaker - CLOSED	
	o PRZR backup heaters breaker - RESET, IN AUTO	
	i. Verify MFW regulating valves in AUTO	i. Place MFW regulating valves in AUTO, if desired.
	j. Dispatch A0 to remove priming ejector from service if desired	
	k. Verify S/G blowdown and sample valve master isolation switch in REMOTE	k. Perform the following:
		1) Dispatch A0 to locally isolate blowdown.
		2) <u>WHEN</u> blowdown locally isolated, <u>THEN</u> place blowdown and sample valve master switch to REMOTE.
		3) Direct A0 to restore blowdown flow (Refer to T-14N, BLOWDOWN SYSTEM FLOW CHANGES).
9	Evaluate MCB Annunciator Status (Refer to AR Procedures)	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Perform Notifications: a. Notify higher supervision b. Request Turbine System Engineer evaluate effect of back pressure transient on the turbine.	
11	Return To Procedure Or Guidance In Effect	
	-END-	

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AP-TURB.4 APPENDIX LIST

TITLE

- 1) FIGURE BACK PRESSURE (FIG-13.0)
- 2) ATTACHMENT COND VACUUM (ATT-6.0)